Title:
"Ghost Tablet" Husks Excreted in Feces in Large Bupropion XL Overdose

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Abstract:
Extended-release medications are widely prescribed across the spectrum of medical specialties; however, there is heterogeneity in how they are formulated. Commonly, they consist of an insoluble matrix or shell from which drug elutes, which may then be observed by patients when excreted in feces. In this report, we describe a patient who ingested a large amount of extended-release bupropion tablets and subsequently passed a large number of these so-called "ghost tablets."

Main Text (447 words):
A 19-year-old male presented to our hospital in status epilepticus following an intentional overdose of an unknown substance. He had access to bupropion XL, vortioxetine, lithium carbonate, and lurasidone. He had prolonged QRS and QTc on EKG, hypotension requiring vasopressors, and tachycardia, symptoms which are consistent with bupropion toxicity. To support the clinical diagnosis, serum bupropion and hydroxybupropion levels were performed on blood taken on admission; these later returned positive at 1800ng/mL (therapeutic ~100ng/mL) and 4200ng/mL, respectively. A lithium serum level performed at the same time returned 0.3mmol/L (therapeutic 0.6-1.2mmol/L). His ICU course was complicated by cardiac arrest and respiratory failure requiring intubation. Throughout his hospital stay, his mother denied that he could have overdosed on medication because she administered them to him and all tablets were accounted for based on pharmacy fill date and time since last refill. On hospital day 3, he had recovered enough to be extubated, but was still too delirious to provide additional history. On hospital day 4, he had several bowel movements containing apparent tablets, ultimately totaling 47 units. He eventually became lucid enough to reveal that he had kept an old prescription of bupropion XL and confirmed that this was the medication he had taken. He recovered fully with aggressive supportive care and was discharged to inpatient psychiatry.

The presence of “ghost tablets” in feces, from which the active drug has been absorbed, has been previously reported with certain XR dosage forms used at therapeutic doses, but not in a case of overdose. Common medications that are known to cause this phenomenon include potassium chloride, pseudoephedrine, fexofenadine/pseudoephedrine, metoprolol succinate, and oxycodone.[2,3] These formulations consist either of insoluble housing compartments for osmotic-release drug delivery or of inert matrices coated or filled with drug that rely on diffusion for delivery.[1] Once the drug is absorbed, the empty matrices or housing compartments continue through the gastrointestinal tract and are excreted in feces. In one study, energy-dispersive X-ray spectroscopy was done on a potassium chloride tablet prior to administration, then following ingestion and recovery from the patient’s feces. Concentrations of potassium were high and then undetectable, respectively.[3]

Abdominal X-ray did not show tablet burden in our patient; however, based on the composition of bupropion XL tablets, no radio-opaque bodies would be expected. Analysis of the recovered tablets for residual drug was not performed; however, as this case illustrates, the presence of tablets in feces should not be interpreted as a sign that the patient was not exhibiting toxicity from bupropion, but rather that the drug was absorbed and the tablet remnants were passed.

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Healthcare providers should be aware that this phenomenon could occur in cases of known or suspected overdose with an XR formulation based on this experience and the medical literature documenting it in therapeutic dosing.[2]

Keywords:
CNS and Psychological < Pharmaceuticals; bupropion; dosage forms; extended release

Disclosures:
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References:

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Figure 1:
Stool specimen containing numerous ghost tablets of extended-release bupropion.

Figure 2:
Close-up of a split bupropion tablet.